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Jun Takeuchi

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SMITH, GAMBRELL & RUSSELL  
1130 CONNECTICUT AVENUE, N.W., SUITE 1130  
WASHINGTON, DC 20036

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JUN TAKEUCHI, MASAACKI KISHIDA, TADAKAZU  
MATSUNAGA, and SHOSUKE ENDOH

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Appeal 2009-1582  
Application 10/663,793  
Technology Center 1700

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Decided:<sup>1</sup> April 22, 2009

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Before CHARLES F. WARREN, ROMULO H. DELMENDO, and  
KAREN M. HASTINGS, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

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<sup>1</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

## STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-4. (Appeal Brief filed February 13, 2008, hereinafter “App. Br.”; Final Office Action entered June 15, 2007). Claims 5-8, the only other pending claims, have been withdrawn from consideration. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

Appellants state the claimed invention is directed to a method of coating a film of a ceramic material on a surface of an internal member disposed in a vacuum processing apparatus, the internal member having holes formed on the surface (*e.g.*, an electrostatic chuck having a suction surface for holding a semiconductor wafer), comprising the steps of: (A) filling the holes of the internal member with padding plugs each of which has a core member made from a metal material and a metal-resin composite layer covering the circumferential surface of the core member, the metal-resin composite being a complex consisting of a metal material and a resinous material exhibiting a nonconjugative property to the coating film ; (B) forming a ceramic coating film on the surface of the internal member by plasma spraying after step (A); and (C) extracting the padding plugs out of the holes of the internal member after step (B) (Spec. 1, ll. 15-20 and 4, l. 28 to 5, l. 8).

Claim 1, the sole independent claim, reads as follows:

1: A coating method for forming a coating film of ceramic material on a surface of an internal member disposed in a vacuum processing apparatus, the internal member having holes formed on the surface, the method comprising:

a step (A) of filling the holes of the internal member with padding plugs each of which has a core member made from a

metal material and a metal-resin composite layer covering the circumferential surface of the core member, the metal-resin composite layer being a complex consisting of a metal material and a resinous material exhibiting nonconjugative property to the coating film;

a step (B) of forming a ceramic coating film on the surface of the internal member by means of plasma spraying after the step (A); and

a step (C) of extracting the padding plugs out of the holes of the internal member after the step (B).

(App. Br. A-1, Claims Appendix).

The prior art references relied upon by the Examiner to reject the claims on appeal are:

Pico	4,115,507	Sep. 19, 1978
Sherstinsky	5,634,266	Jun. 3, 1997
Rice	US 2003/0154919 A1	Aug. 21, 2003
Taneyama <sup>2</sup>	JP 05278038 A	Oct. 26, 1993
Harada <sup>3</sup>	WO 01-54188 A1	Jul. 26, 2001

Appellants' admitted prior art (Spec. 1-4).

The Examiner rejected the claims under 35 U.S.C. § 103(a) as follows: (i) claim 1 as unpatentable over the admitted prior art in view of Rice and JP '038 (Ans. 4); and (ii) claims 2-4 as unpatentable over the admitted prior art in view of Rice, JP '038, WO '188, Pico, and Sherstinsky (Ans. 7).

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<sup>2</sup> We refer to Taneyama as JP '038. Also, in this opinion, our citations are to the English language translation of JP '038 prepared by Schreiber Translations, Inc. (PTO 08-3002).

<sup>3</sup> In this opinion, we refer to Harada as "WO '188." Our citations are to the English language translation of Harada prepared by Schreiber Translations, Inc. (PTO 08-3023).

The Examiner found that Appellants' admitted prior art discloses every limitation of the claimed invention "except the use of the metal padding plug coated with a metal-resin composite layer . . . with the metal-resin composite layer being a complex consisting of a metal material and a resinous material exhibiting nonconjugative property to the coating film, as in step (A), and removing the padding plugs after coating (step C)" (Ans. 4, l. 18 to 5 l. 2). To account for this difference, the Examiner relied on Rice, which discloses a coating, such as TEFLON or a mold release coating, to reduce the adherence of thermal spray droplets from plasma spraying on a masking cup (Ans. 5, ll. 3-10). Because Rice does not disclose the use of a metal material as part of the coating, the Examiner further relied on JP '038, which discloses a mold release coating of a composite of nickel metal and PTFE resin (Ans. 5, ll. 11-14). In view of these findings, the Examiner concluded that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art to use metal padding plugs that have been coated with a nickel-PTFE release coating to mask the gas holes during coating . . . in order to provide a[] metal padding plug that does not stick to the coating material" (Ans. 5, ll. 17-21). Furthermore, the Examiner concluded that it would have been obvious to one of ordinary skill in the art "to remove the padding plugs after coating . . . so that the gas injection holes could be used for injecting gas as desired" (Ans. 6, ll. 16-20).

Appellants, on the other hand, contend:

Applicants' step (B) requires "plasma spraying" to form the ceramic coating film. Plasma spraying inherently involves spraying ceramic particles that are at a high temperature and that are at a high kinetic energy against the surface of

Applicants' hole-masking padding plugs. Such plasma spraying attacks the surface of the plugs. . . .

While Applicants are concerned with *protection* of the coated member holes from the plasma spray, JP '038 is concerned with finding a good *demolding* compound. JP '038 teaches that a PTFE-containing Ni-P plating improves the *releasability of a rubber* product formed in the mold. It does not teach anything concerning the applicability of a PTFE-containing Ni-P plating to surface coating with a plasma sprayed ceramic.

(App. Br. 6, ll. 5-18)

### ISSUE

Thus, the issue arising from the respective contentions of the Examiner and Appellants is:

Have Appellants shown that the Examiner reversibly erred by failing to provide a reason why a person having ordinary skill in the art would have been led to use the metal-resin material release layer for rubber molds as disclosed in JP '038 as a covering layer for padding plugs used in a plasma spraying process for ceramic coatings as disclosed in the admitted prior art?

### FINDINGS OF FACT (FF)

Findings of Fact throughout this Opinion are supported by at least a preponderance of the evidence of record.

1. Appellants' admitted prior art discloses metal padding plugs used to prevent a plasma sprayed coating from entering holes in members whose surface is plasma spray coated with ceramic material (Spec. 2, ll. 6-9, 25-28; 3, ll. 23-29).

2. Appellants' admitted prior art discloses that it was known that plasma sprayed coating material conjugates to the metal padding plugs, thus causing problems during removal of the plugs because they have welded to the coated film but does not disclose Appellants' claimed metal-resin composite layer covering the circumferential surface of the core member (Spec. 3, ll. 24-31).
3. Rice discloses a masking apparatus for use in a thermal spraying process to minimize overspraying (§ 0035).
4. Rice discloses that thermal spraying processes are known to deposit metal or ceramic and include a thermal spray gun "utiliz[ing] a high intensity arc to heat inert gas in the gun so as to effect a high velocity gas stream or plasma" (§ 0002).
5. Rice teaches that a coating of a mold release on a masking cup used in thermal spraying processes reduces adherence of ceramic or metal thermal spray droplets to the masking cup but does not disclose Appellant's claimed metal-resin composite layer covering the circumferential surface of the core member (§§ 0002 and 0044).
6. JP '038 discloses a plating that acts as a mold release on dies for use in a process for molding rubber (§ 0007).
7. JP '038 discloses "[t]he dies for molding rubber that are plated with electroless nickel containing the polytetrafluoroethylene fine powder has [sic] much smaller friction resistance against a molded rubber article by the plating in comparison with conventional chrome-plated, nickel-plated, and molded rubber article" (§ 0011).

#### PRINCIPLES OF LAW

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007).

While *KSR* explains that an obviousness “analysis need not seek out precise [prior art] teachings,” it nonetheless did not dispense with the need for evaluating the evidence to determine whether a person having ordinary skill in the art would have had “an apparent reason to combine the known elements in the fashion claimed.” *Id.* at 418.

#### ANALYSIS

Appellants contend that JP ‘038 “does not teach anything concerning the applicability of a PTFE-containing Ni-P plating to surface coating with a plasma sprayed ceramic” (App. Br. 6, ll. 17-18). Furthermore, Appellants assert that “one of ordinary skill in the art would not have been motivated by JP ‘038 and/or Rice to use Applicants’ padding plugs in the admitted prior art arrangements” (App. Br. 7, ll. 4-7).

We agree with Appellants. It is undisputed that neither Appellants’ admitted prior art nor Rice discloses the use of the claimed metal-resin composite layer covering the circumferential surfaces of core members made from metal material in a plasma spraying process of the type with which the present invention is concerned (FF 1-5). While JP ‘038 discloses a metal-resin plating material, its teachings are limited to the use of the material as a mold release in a rubber molding process (FF 6 and 7).



In this case, the Examiner has not adequately explained why a person having ordinary skill in the art would have been led to combine a prior art reference that teaches mold release agents for use in a process for molding rubber with the admitted prior art and Rice, which are directed to completely different subject matter. In this regard, the Examiner has not directed us to any evidence or persuasive reasoning that the disclosed metal-resin material of JP '038 would reasonably have been expected to be successful in thermal spraying processes (Ans. 4-19). While Rice does disclose that a mold release agent can be used, Rice's disclosure must be evaluated in its proper context, which would only reasonably suggest mold release agents useful for ceramic or metal coatings.

On this record, the Examiner has not made out a prima facie case of obviousness.

### CONCLUSION

Appellants have shown that the Examiner reversibly erred by failing to provide a reason why a person having ordinary skill in the art would have been led to use the metal-resin material release layer for rubber molds as disclosed in JP '038 as a covering layer for padding plugs used in a plasma spraying process for ceramic coatings as disclosed in the admitted prior art.

### ORDER

The decision of the Examiner rejecting claim 1 under 35 U.S.C. § 103(a) as unpatentable over the admitted prior art in view of Rice and JP '038 and claims 2-4 under 35 U.S.C. § 103(a) as unpatentable over the

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admitted prior art in view of Rice, JP '038, WO '188, Pico, and Sherstinsky  
is reversed.

REVERSED

rvb

SMITH, GAMBRELL & RUSSELL  
1130 Connecticut Avenue, NW  
Suite 1130  
Washington, DC 20036